

REMARKS

Rejection of Claim 1 under 35 U.S.C. 112:

The Office Action rejected Claim 1 under 35 U.S.C. 112, for lack of antecedent basis for the term “processed.” Applicants have amended the term to “formed” in a good faith attempt to obviate the rejection. No new matter is introduced by the amendment. Applicants respectfully request that amendment be found to have corrected the ground for the rejection and that the rejection under 35 U.S.C. 112 be withdrawn accordingly.

Regarding Independent Claims 1 and 26:

The Office Action correctly notes that independent claims 1 and 26 claim a product by process. Applicants respectfully traverse the rejection noting that the product cited in the prior art is substantially different than the product claimed in the present application, and the prior art therefore does not teach or suggest the present invention.

The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. See, MPEP 2113, citing *In re Garnero*, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979).

In the present case, the product may only be defined by the process steps by which the product is made, and the manufacturing process steps would be expected to impart distinctive characteristics to the final product. The product of the present invention is patentably distinct and non-obvious over the cited prior art.

Claim 1:

The Office Action rejected claims 1-6, 9, 10, 26, 29, 35 and 35 under 35 U.S.C. 102(a) as obvious over Kido (U.S. Patent Application Publication 2002/0119586 A1) [hereinafter "Kido"] in vie of Sturm, et al. (U.S. Patent 6,087,196) [hereinafter "Sturm"].

Specifically, as noted in the Office Action, independent Claim 1, as amended, specifies "the formed semiconductor layer having a shape formed by dropping a droplet." See, Office Action, page 3. Moreover, Claim 1 specifies that such "formed semiconductor layer" is a "thin firm transistor section in which a gate electrode is formed on a substrate." The product then is "A TFT array substrate comprising: a thin film transistor section in which a gate electrode is formed on a substrate, and in which a semiconductor layer that has been etched after a mask material is dropped onto a semiconductor film is formed on the gate electrode via a gate insulation layer, the formed semiconductor layer having a shape formed by dropping a droplet." See, independent Claim 1.

In contrast, Kido teaches a "semiconductor island" that is "formed to have a substantially rectangular planer shape." See, Kido, paragraph [0081]. Kido teaches a rectangular semiconductor layer formed by dry etching and the reflow mask pattern. See, Kido, paragraphs [0080]-[0081]. Therefore, product in Kido is not the product in the present application. Dry etching and reflow masking does not teach or suggest forming a shape by "dropping a droplet," and a "substantially rectangular semiconductor layer" does not teach or suggest a substantially circular "shape formed by dropping a droplet."

The Office action correctly notes that Kido does not disclose a semiconductor layer formed by dropping a droplet. See, Office Action, page 3. the Office Action cites Sturm as teaching a semiconductor layer having a shape formed by dropping a droplet using ink-jet printing. See, Office Action, page 3.

Applicants respectfully traverse the grounds of the rejection citing to Sturm noting that Sturm also fails to teach or suggest the present invention.

Secondary prior art reference, Sturm, teaches the creation of organic light emitting diodes (OLEDs) on a polyester substrate. Sturm teaches the creation of a “continuous sheet of polymer,” “organic layers,” local areas,” or “Organic ‘islands’.” See, Sturm, col. 4, line 56 through col. 5, line 46. Sturm teaches to use an ink jet to deposit organic material onto the surface of a substrate to create an OLED. One source of confusion may be the use of the term “organic ‘island’,” which is not further defined. However, Applicants respectfully submit that it is an unwarranted stretch of the reference to conclude that the term “organic ‘island’” in the deposition of organic material either teaches or suggests a forming a semiconductor layer on a gate electrode with the “shape formed by dropping a droplet.” Therefore, the products are different.

More specifically, in the present invention, the material applied by the inkjet method is the mask material, not a semiconductor material. The semiconductor layer is formed by first adjusting the thickness with a conventional technique, and then applying a mask material on the substrate using an inkjet method. This is followed by an etching process to obtain the semiconductor layer as desired. The resulting semiconductor layer has a substantially uniform thickness, and the semiconductor layer has the same shape as the droplet of the mask material when their projections are compared. The thickness of the semiconductor layer is determined when the semiconductor layer is laminated on the insulating substrate. This is advantageous in term of ease of adjustment.

In contrast, while Sturm discloses directly applying a semiconductor layer material onto a substrate using an inkjet method, the reference lacks the technical idea of obtaining a semiconductor layer as desired by performing an etching process after the mask material is applied by an inkjet method. For example, when the material of the semiconductor layer is directly applied to the substrate by an inkjet method, the droplet (semiconductor layer) will be of

the shape in which the thickness is the greatest at the center and becomes thinner towards the periphery in the cross sections. That is, in the method of directly dropping a semiconductor layer material onto the substrate, it is difficult to control a thickness of the semiconductor layer.

Claim 26:

Claim 26 was also rejected under Kido in view of Sturm. Applicants also respectfully traverse this rejection noting that the product of independent Claim 26, as currently amended, in the present invention is as follows:

A TFT array substrate, comprising:
a thin firm transistor section in which a gate electrode is formed on a substrate, and in which a semiconductor layer that has been etched after a mask material is dropped onto a semiconductor film and a conductor layer are formed on the gate electrode via a gate insulation layer,
wherein:
the conductor layer is formed in contact with the semiconductor layer and one of source and drain electrodes of the thin firm transistor section, and has a portion formed by dropping a droplet, the conductor layer and the semiconductor layer having substantially the same shape in the portion formed by dropping a droplet.

See, Independent Claim 26.

The same lack of teaching or suggestion noted above in traversal of independent claim 1 is cited here also in traversal of independent Claim 26, noting in particular that Sturm teaches directly applying a semiconductor layer material onto a substrate using an inkjet method in contrast to obtaining the desired semiconductor by an etching process after the mask material is applied by an inkjet method.

Regarding Dependent Claims 2-6, 9, 10, 27-29, 34, and 35:

Applicants respectfully submit that Claims 2-6, 9, 10, 27-29, 34, and 35 are at least allowable based on the inventiveness and allowability of independent Claims 1 and 26 from which they depend.

Claims 27 and 28:

The Office Action rejected claims 27 and 28 under Kido in view of Sturm and further in view of Miyazaki, et al. (U.S. Patent 6,608,353 B2) [hereinafter "Miazaki"].

In addition, regarding dependent Claims 27 and 28, Applicants respectfully traverse the rejection noting that the products of neither Kido nor Sturm nor Miyazaki teach or suggest the present invention at least for the reason that they do not teach the invention of independent Claim 26, from which Claims 27 and 28 depend.

The differences between the product of the present invention and those of Kido and Sturm is discussed above. In addition, Applicants note that the product taught in Miyazaki neither teaches nor suggests the product of Claim 1, being a TFT array substrate comprising a thin film transistor section in which a gate electrode is formed and a semiconductor layer is formed on the gate electrode via a gate insulation layer, the formed semiconductor layer having a shape formed by dropping a droplet. Similarly, Miyazaki neither teaches nor suggests the product of claim 26.

Conclusion

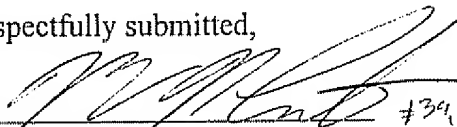
In view of the above remarks, it is believed that claims are allowable.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Terrell C. Birch Reg. No. 19,382 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

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